IN THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) An active-power filter to regulate a DC input current drawn from a DC power source comprising:

control circuitry to combine an integrated output-voltage sense signal, an input-voltage sense signal and an output-load feedforward signal to generate a control signal; and

power converter circuitry to regulate ~~a~~ ripple in the DC input current based at least in part on the control signal,

wherein the output-load feedforward signal is ~~a separate control signal~~ generated by internal circuitry of an output-load subsystem which draws DC output current through ~~from~~ the active power filter, and

wherein the ripple in the DC input current produced by changes in the DC output current drawn by the output-load subsystem is reduced by operation of the control circuitry and the power converter circuitry.

2. (Currently Amended) The active-power filter of claim 1 wherein the output-load feedforward signal is generated by the internal circuitry of the output-load subsystem to indicate when one of either relative power or the DC output current changes,

wherein the output-voltage sense signal is measured within the active power filter and is proportional to an output voltage of the active power filter, and

wherein the output-load feedforward signal is separate from the output-voltage sense signal and is generated by the output-load subsystem.

3. (Currently Amended) The active-power filter of claim 1 wherein the output-load feedforward signal indicates that one of either relative power or the DC output current drawn by the output-load subsystem will change.

4. (Currently Amended) The active-power filter of claim 1 wherein the control circuitry includes an integrator to integrate a difference between the output-voltage sense signal and a reference signal, ~~and~~

wherein the output-load subsystem draws the DC output current from the power converter circuitry having an output current ripple at a nominal ripple frequency, and

wherein components of the integrator are selected to provide a control-loop bandwidth significantly less than the nominal ripple frequency.

5. (Original) The active-power filter of claim 1 wherein the control circuitry comprises:

an error amplifier to integrate a difference between the output-voltage sense signal and a reference voltage; and

a summing amplifier to sum the integrated output-voltage sense signal with the input-voltage sense signal and the output-load feedforward signal to generate an error voltage corresponding to the control signal.

6. (Original) The active-power filter of claim 5 wherein the control circuitry further comprises circuitry to weight the integrated output-voltage sense signal, the input-voltage sense signal and the output-load feedforward signal prior to summing by the summing amplifier.

7. (Currently Amended) An active-power filter comprising:

control circuitry to combine an integrated output-voltage sense signal, an input-voltage sense signal and an output-load feedforward signal to generate a control signal; and

power converter circuitry to regulate a DC input current based at least in part on the control signal,

wherein the output-load feedforward signal is a separate control signal generated by internal circuitry of an output-load subsystem which draws output current from the active power filter,

wherein the control circuitry includes an integrator to integrate a difference between the output-voltage sense signal and a reference signal,

wherein the output-load subsystem draws the output current from the power converter circuitry having an output current ripple at a nominal ripple frequency,

wherein components of the integrator are selected to provide a control-loop bandwidth significantly less than the nominal ripple frequency, and

~~The active-power filter of claim 4~~ wherein the control circuitry further comprises:

an output-load feedforward signal amplifier to amplify the output-load feedforward signal prior to summing by the summing amplifier; and

an input-voltage sense signal amplifier to amplify the input-voltage sense signal prior to summing by the summing amplifier.

8. (Previously Presented) The active-power filter of claim 2 wherein the control circuitry comprises a pulse-width-modulator (PWM) for comparing the control signal with a current-sense signal to generate a switching signal for the power converter circuitry, a pulse-width of the switching signal being modulated signal based, at least in part, on a difference between the control signal and the current-sense signal.

9. (Currently Amended) The active-power filter of claim 8 wherein the power converter circuitry receives the DC input current and provides the DC output current to ~~a~~ the output-load subsystem based at least in part on the switching signal.

10. (Currently Amended) The active-power filter of claim 9 wherein the power converter circuitry comprises:

an inductive element to receive an input current;

a switching element responsive to the switching signal to draw the DC input current through the inductive element while the switching element is conducting;

an output-rectifying element to draw current from the inductive element while the switching element is not conducting; and

a charge-storage element to store charge from current received through the rectifying element for providing the DC output current to the output-load subsystem.

11. (Currently Amended) The active-power filter of claim 9 wherein the power converter circuitry operates as a current mode converter which regulates current through a switching element on a cycle-by-cycle basis using the current-sense signal to tightly regulate the ripple in the DC input current and loosely regulate an output voltage.

12. (Currently Amended) The active-power filter of claim ~~11~~ 2 wherein:

the current-sense signal indicates an amount of current drawn through a switching element;

the output-voltage sense signal indicates the output voltage;

the input-voltage sense signal indicates an input voltage of the power converter; and

the output-load feedforward signal indicates that the DC output current drawn by the output-load subsystem will change.

13. (Cancelled)

14. (Currently Amended) A method of regulating a DC input current drawn from a DC power source by an active-power filter, the method comprising:

integrating an output-voltage sense signal, the output-voltage sense signal indicating ~~the~~ a DC output voltage; and

summing the integrated output-voltage sense signal with an ~~the~~ input-voltage sense signal and an output-load feedforward signal to generate a control signal for controlling ripple in the DC input current drawn by the active-power filter,

wherein the output-load feedforward signal indicates when DC output current drawn by a load subsystem will change, and the input-voltage sense signal indicates an input voltage of the active-power filter, ~~and~~

wherein the output-load feedforward signal is a separate control signal generated by internal circuitry ~~by internal circuitry~~ of the load subsystem, and

wherein the ripple in the DC input current produced by changes in the DC output current drawn by the load subsystem is reduced by the integrating and summing performed by the active power filter.

15. (Currently Amended) The method of claim 14 further comprising:

receiving the output-load feedforward signal from the ~~output~~ [[-]] load subsystem;

generating a switching signal switch-on and switch-off a switching element, wherein the switching element draws the DC input current when conducting; and

modulating a pulse-width of the switching signal based on the control signal and a current-sense signal, the current-sense signal indicating an amount of current drawn through switching element.

16. (Currently Amended) The method of claim 15 further comprising providing, by the active-power filter, the DC output current to the load subsystem which draws the DC output current with an output current ripple at a nominal frequency, ~~whereby~~ wherein the ripple in the DC input current drawn by the active-power filter is tightly regulated and the DC output voltage is loosely regulated.

17. (Currently Amended) An active-power filter for regulating a DC input current drawn from a DC power source comprising:

a low-bandwidth control loop for loosely regulating ~~an~~ a DC output voltage to an output-load subsystem; and

a high-bandwidth input control loop to tightly regulate the ripple in the DC input current using current-mode control using an output-load feedforward signal generated by internal circuitry of the output-load subsystem, the output-load feedforward signal being separate from the output voltage,

wherein the ripple in the DC input current produced by changes in DC output current drawn by the output-load subsystem is reduced by operation of the high-bandwidth input control loop.

18. (Previously Presented) The active-power filter of claim 17 comprising:

control circuitry to implement the control loops by combining an integrated output voltage with an input voltage signal and the output-load feedforward signal, and to generate a control signal; and

switching-signal generation circuitry to further implement the control loops by providing a switching signal based on the control signal and a current-sense signal.

19. (Currently Amended) The active-power filter of claim 18 wherein:

the output-load feedforward signal indicates when the DC output current drawn by the output-load subsystem changes, the output-load subsystem drawing the DC output current from the active-power filter, and

the current-sense signal indicates an amount of current drawn through a switching element of the power converter.

20. (Currently Amended) A system comprising:

a load subsystem to draw DC output current and having internal circuitry to generate an output-load feedforward signal to indicate changes in the DC output current drawn by the load subsystem; and

an active-power filter to draw DC input current from a DC power source and to provide the DC output current to the load subsystem by loosely regulating an output voltage for the load subsystem, the active-power filter to tightly regulate ripple in the DC input current drawn by the active-power filter from the DC power source based at least in part on the output-load feedforward signal,

wherein the output-load feedforward signal is separate from the output voltage, and

wherein the ripple in the DC input current produced by changes in DC output current drawn by the output-load subsystem is reduced by operation of the active power filter.

21. (Original) The system of claim 20 wherein the active-power filter comprises:

control circuitry to combine an integrated output-voltage sense signal, an input-voltage sense signal and the output-load feedforward signal to generate a control signal; and

switching-signal generation circuitry to provide a pulse-width-modulated switching signal to a switching element based on the control signal and a current-sense signal.

22. (Currently Amended) A system comprising:

a load subsystem to draw output current and having internal circuitry to generate an output-load feedforward signal to indicate changes in the output current drawn by the load subsystem; and

an active-power filter to provide the output current to the load subsystem by loosely regulating an output voltage for the load subsystem, the active-power filter to tightly regulate DC input current drawn by the active-power filter based at least in part on the output-load feedforward signal,

wherein the active-power filter comprises:

control circuitry to combine an integrated output-voltage sense signal, an input-voltage sense signal and the output-load feedforward signal to generate a control signal; and

switching-signal generation circuitry to provide a pulse-width-modulated switching signal to a switching element based on the control signal and a current-sense signal,

wherein the output-load feedforward signal is separate from the output voltage,

~~The system of claim 21~~ wherein the control circuitry includes an integrator to integrate the output-voltage sense signal, and

wherein the output current is drawn by the load subsystem with a current ripple having a nominal ripple frequency, and wherein components of the integrator are selected to provide a control loop bandwidth significantly less than the nominal ripple frequency to tightly regulate the input current.

23. (Original) The system of claim 22 wherein the power converter circuitry operates as current mode converter which regulates current through a switching element on a cycle-by-cycle basis using current-sense signal to tightly regulate the input current and loosely regulate an output voltage.

24. (Original) The system of claim 23 wherein:

the current-sense signal indicates an amount of current drawn through a switching element;

the output-voltage sense signal indicates the output voltage;

the input-voltage sense signal indicates an input voltage of the power converter; and

the output-load feedforward signal indicates that current drawn by the output-load subsystem will change.

25. (Previously Presented) The system of claim 22 wherein the system comprises a satellite system and the load subsystem comprises a cryogenic cooling system having a motor to drive a cryogenic-cooling pump,

wherein the circuitry generates the output-load feedforward signal indicating that the motor will draw current, and

wherein the active-power filter loosely regulates an output voltage for the motor and tightly regulates the input current drawn by the active-power filter based at least in part on the output-load feedforward signal.

26. (Previously Presented) The system of claim 22 wherein the system comprises a system for generating pulsed energy, wherein the load subsystem comprises one or either a laser or RF amplifier and firing electronics which generate the output-load feedforward signal indicating that the amplifier will draw an increased or decreased current, and

wherein the active-power filter loosely regulates an output voltage for the amplifier and tightly regulates the input current drawn by the active-power filter for the amplifier based at least in part on the output-load feedforward signal.